

**KEY FOR SRMEEE-2010**  
**VERSION – A**

**[PHYSICS, CHEMISTRY, MATHEMATICS & BIOLOGY]**

**Part 1 – Physics**

1. A body starts from rest and moves with a uniform acceleration of  $6 \text{ ms}^{-2}$  .....  
Ans : 21 m
2. Dimensions are not same for the pair  
Ans : Power and strain
3. If L, C, R denote the inductance, capacitance and resistance respectively, ...  
Ans :  $\text{M}^\circ\text{L}^\circ\text{T}^{-3}\text{I}^\circ$
4. Pick out the stranger in the group  
Ans : Magnetic moment
5. A scooter is going round a circular road of radius 200 m at a speed of  $20 \text{ ms}^{-1}$  ....  
Ans :  $0.1 \text{ rad s}^{-1}$
6. In some region, the gravitational field is zero...  
Ans : Must be constant
7. Two spheres of mass m and M are situated in air and the gravitational force between them ...  
Ans : f
8. The ratio of the lengths of two wires a and b of same material is 1 : 3 ....  
Ans : 1:27
9. Bernoulli's theorem is based on the principle of conservation of  
Ans : Energy
10. The ring of radius 1 m and mass 15 kg is rotating about its diameter ....  
Ans : 2343.7 J
11. The total energy of a body executing simple harmonic motion is E..  
Ans :  $\frac{8}{9}E$
12. Pick out the stranger  
Ans : newton-meter  
**Note** : If considered as torque, will be a vector
13. A tunnel has been dug through the centre of the earth and a ball is ....  
Ans : 42 minute
14. Entropy of the universe tends to be  
Ans : Maximum
15. Heating of water at atmospheric pressure is considered under the ...  
Ans : Isobaric
16. A Carnot engine working between 200 K and 500 K has a work output of 900 J...  
Ans : 1500 J
17. A heavenly body is receding from Earth such that the fractional change in ...  
Ans : 2c  
**Note** : No matter can move even at a speed of light
18. The penetration of light into the region of geometrical shadow is called  
Ans : Diffraction
19. A man is 160 cm tall and his eyes are 15 cm below the top of his head.....  
Ans : 80 cm

20. Light of wavelength  $5000 \text{ \AA}$  in air has wavelength in glass ...

Ans :  $3333 \text{ \AA}$

21. A charge Q is placed at the centre of the line joining two equal charges q .....

Ans :  $\frac{-q}{4}$

22. A capacitor is kept connected to a battery and a dielectric slab is inserted between ....

Ans : Work is done at the cost of the battery

23. When two identical capacitors are in series, they have  $4 \mu\text{F}$  capacitance ...

Ans :  $8 \mu\text{F}$

24. A cell of emf 4 V and internal resistance  $0.2 \Omega$  is connected with the resistance of ....

Ans : 3.6 V

25. At certain place, horizontal component is  $\frac{1}{\sqrt{3}}$  times the vertical component ....

Ans :  $60^\circ$

26. In a tangent galvanometer, a current of 0.2 A produces a deflection of  $30^\circ$ .

Ans : 0.6 A

27. If we consider electrons and protons of the same wavelength, they will have the same ...

Ans : Momentum

28. The momentum of a proton is  $2.5 \times 10^{-29} \text{ kg ms}^{-1}$ .

Ans :  $1.14 \times 10^{13} \text{ Hz}$

**Note :** Must be photons and not protons

29. On the bombardment of neutron with boron, an  $\alpha$  particle is emitted....

Ans :  ${}_3\text{Li}^7$

30. When cathode rays enter into a uniform magnetic field perpendicular to the direction of .....

Ans : Circular

31. The pulleys and strings shown in figure are smooth and of negligible mass....

Ans :  $45^\circ$

32. In the Boolean expression, which gate be expressed as  $Y = A \bullet B$  ?

Ans : NAND gate

33. The current gain of the transistor in the common base mode is 0.9....

Ans : 9

34. If the base and the collector of a transistor are in forward bias, then ....

Ans : All of these

35. The refractive index of the material of a prism is 2. What is the maximum possible ...

Ans :  $60^\circ$

## Part 2 - Chemistry

36. Which one is diamagnetic molecule / ion ?

Ans :  $\text{O}_2^{2-}$

37. Which of the following is called a polyamide ?

Ans : nylon

38. How many moles of magnesium phosphate  $\text{Mg}_3(\text{PO}_4)_2$  will contain 0.25 mole of .....

Ans :  $3.125 \times 10^{-2}$

39. A pressure cooker reduces cooking time for food because ...

Ans : boiling point of water involved in cooking is increased

40. Consider the reaction  $\text{CaCO}_{3(g)} \rightleftharpoons \text{CaO}_{(s)} + \text{CO}_{2(g)}$  in closed container at ....

Ans : remains unaffected

41. 25 ml of a solution of barium hydroxide on titration with a 0.1 molar solution ....  
Ans : 0.07
42. Which of the following is not a homogeneous mixture ?  
Ans : milk
43. An ionic compound has a unit cell constituting A ions at the corners of a cube .....  
Ans :  $AB_3$
44. Benzene and toluene form nearly ideal solutions. At 20°C, the vapour pressure ...  
Ans : 50
45. The number of moles of ions given on complete ionization of 1 mole ....  
Ans : 4
46. During the extraction of copper, the impurity (FeS) is removed as slag ....  
Ans :  $FeSiO_3$
47. All monosaccharides \_\_\_\_\_ Tollens' reagent.  
Ans : reduce
48. Calculate  $\Delta H$  (in joules) for  $C_{(graphite)} \rightarrow C_{(diamond)}$  from the following data:  
Ans : 1900
49. In the following reaction ; A and B respectively are  
Ans :  $C_2H_4, alc.KOH/\Delta$
50. What is X in the following nuclear reaction ?  
Ans :  $\gamma$  ray (gamma ray)
51. The number of chiral centers in ( $\pm$ ) glucose is  
Ans : 4
52. Action of  $NaNO_2$  with dilute HCl on  $ArNH_2$  yields  
Ans : cyclohexanol
53. What are the units of equivalent conductivity of a solution ?  
Ans :  $mho.cm^2.equiv^{-1}$
54. The Incorrect statement among the following is  
Ans : The second ionization potential of Mg is greater than the second ionization potential of Na.
55. When a quantity of electricity is passed through  $CuSO_4$  solution, 0.16 g of copper gets ....  
Ans :  $56 cm^3$
56. A distinctive and characteristic functional group of fats is ...  
Ans : an ester group
57. The highest magnetic moment is shown by the transition metal ...  
Ans :  $3d^5$
58. Assertion A :  $Sb_2S_3$  is not soluble in yellow ammonium sulphide  
Reason R : The common ion effect due to  $S^{2-}$  ions reduces the stability of  $Sb_2S_3$   
Ans : both A and R are false statements
59. Potassium soaps are  
Ans : soft soaps
60. The IUPAC name of  $CH_3 - CH_2 - COO - COCH_3$  is  
Ans : ethanoic propanoic anhydride
61.  $C_6H_6 + CCl_4 \xrightarrow{AlCl_3} X \xrightarrow{H_2O} Z$   
Ans :  $C_6H_5 - CO - C_6H_5$
62. Decrease in ionic size in a period is observed in  
Ans : Both (a) and (b)

63. Which of the following is not a chromophore ?

Ans :  $-\text{NH}_2$

64. Which is used as food preservative ?

Ans : Sodium benzoate

65. Which one of the following is an analgesic ?

Ans : Aspirin

66.  $\Delta S^\circ$  will be highest for

Ans :  $\text{CaCO}_{3(s)} \rightarrow \text{CaO}_{(s)} + \text{CO}_{2(g)}$

67. Philosopher's wool when heated with BaO at  $1100^\circ\text{C}$  gives a compound.

Ans :  $\text{BaZnO}_2$

68. Match the lists I and II and pick the correct matching from the codes given below :

Ans : A-2, B-5, C-1, D-4, E-3

69. Which statement about enzymes is not correct

Ans : enzymes can catalyse any reaction

70. The molecular formula of dithionic acid is

Ans :  $\text{H}_2\text{S}_2\text{O}_6$

### Part 3 – Maths

71. The number of solutions of  $\sqrt{4-x} + \sqrt{x+9} = 5$

Ans : 2

72. The sum to n terms of the series ....

Ans :  $\frac{2n}{(n+1)}$

**Note** : If the first term is read as  $\frac{1}{1^3}$ , then, the answer is  $\frac{2n}{(n+1)}$ . Otherwise there is no correct option.

73. Let  $f(x) = x^2$  and  $g(x) = 2^x$  then the solution

Ans :  $\{0, 2\}$

74. If the mean of a set of observations  $x_1, x_2, \dots$

Ans : 42

75. If  $e^x = y + \sqrt{1+y^2}$  then the value of y is

Ans : None of these

76. If the curves  $y^2 = 6x$ ,  $9x^2 + by^2 = 16$  cut each other at right angles ...

Ans :  $\frac{9}{2}$

77.  $\int \frac{e^x(1+\sin x)}{1+\cos x} dx$  is equal to

Ans :  $e^x \tan \frac{x}{2} + C$

78. The value of  $\int_0^{\pi/2} \frac{1+2\cos x}{(2+\cos x)^2} dx$  is

Ans :  $\frac{1}{2}$

79. The solution of the differential equation  $\frac{d^2x}{dt^2} + x = 0$ ;  $x(0) = 1$ ,  $x'(0) = 0$

Ans : is a periodic function

80. If  $|a| = 2$ ,  $|b| = 3$ ,  $|c| = 4$  and  $a + b + c = 0$  then the value of  $b.c + c.a + a.b$  is equal to

Ans :  $\frac{-29}{2}$

81. The lines  $\frac{x-2}{1} = \frac{y-3}{1} = \frac{z-4}{-k}$  ...

Ans :  $k = 0$

82. The relation  $R : A \rightarrow B$ , where  $A = \{1, 2, 3, 4, 5\}$  and  $B = \{u, v, x, y, z\}$  ...

Ans :  $\{(1, u), (2, v), (3, x), (4, z), (5, y)\}$

83. If the imaginary part of  $\frac{2z+1}{iz+1}$  is  $-4$ , then the locus of the point representing z in the ....

Ans : a circle

84. If A, B, C are the angles of a triangle, then

Ans : 0

85. If  $\sin\theta, \cos\theta, \tan\theta$  are in G.P then  $\cos^9\theta + \cos^6\theta + 3\cos^5\theta - 1$  is equal to

Ans : 0

86. If  $1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \dots = \frac{\pi}{4}$ , then ....

Ans :  $\frac{\pi}{8}$

87. In a group of 8 girls, two girls are sisters. The number of ways in which the girls can sit so ...

Ans : None of these

88. The number of ways of dividing 15 men and 15 women into 15 couples, ....

Ans : 1240

89. The equation  $\Delta = \begin{vmatrix} x-a & x-b & x-c \\ x-b & x-c & x-a \\ x-c & x-a & x-b \end{vmatrix} = 0$  is

satisfied when ...

Ans : No correct option

**Note** : None of the printed options satisfy the given relation. The answer should be  $x = \frac{(a+b+c)}{3}$

90. An equation of a straight line passing through the intersection of the straight lines .....

Ans :  $23x + 23y = 11$

91. The number of values of c such that the straight line  $y = 4x + c$  touches the ....

Ans : 2

92. An ellipse has OB as a semi-minor axis. F, F<sup>1</sup> are its foci, and the angle FBF<sup>1</sup> is a ....

Ans :  $\frac{1}{\sqrt{2}}$

93. If  $\omega$  is a complex cube root of unity, then the

matrix  $A = \begin{vmatrix} 1 & \omega^2 & \omega \\ \omega^2 & \omega & 1 \\ \omega & 1 & \omega^2 \end{vmatrix}$  is a

Ans : singular matrix

94. If  $\lim_{x \rightarrow a} \frac{a^x - x^a}{x^x - a^a} = -1$ , then the value of a is

Ans : 1

95. The slopes of the normals to the parabola  $y^2 = 4ax$  intersecting at a point on the ....

Ans : A.P

96. The area of the figure bounded by  $y^2 = 9x$

Ans :  $\frac{1}{2}$

97. The area of the plane figure bounded by lines

$y = \sqrt{x}$ ,  $x \in [0, 1]$ ,  $y = x^2$ ,  $x \in [1, 2]$  ...

Ans :  $\frac{19}{3}$

98. A solution of  $y = 2x \left( \frac{dy}{dx} \right) + x^2 \left( \frac{dy}{dx} \right)^4$  is

Ans :  $y = 2\sqrt{cx} + c^2$

99. If the vectors  $AB = -3\hat{i} + 4\hat{k}$  and

$AC = 5\hat{i} - 2\hat{j} + 4\hat{k}$  are the sides of a triangle ABC.

Ans :  $\sqrt{18}$

100. An equation of the line passing through  $3\hat{i} - 5\hat{j} + 7\hat{k}$  and perpendicular to the plane ...

Ans :  $\frac{x-3}{3} = \frac{y+5}{-4} = \frac{z-7}{5}$

**Note** : "passing through  $3\hat{i} - 5\hat{j} + 7\hat{k}$ " should be read as "passing through the point whose position vector is  $3\hat{i} - 5\hat{j} + 7\hat{k}$ "

101. If from each of the three boxes containing 3 white and 1 black, 2 white and 2 black, .....

Ans :  $\frac{13}{32}$

102. If  $x$  and  $y$  are two sets, then  $x \cap (y \cup x)^c$  equals

Ans :  $\phi$

103. If  $Z = \frac{7-i}{3-4i}$ , then  $Z^{14}$  equals

Ans :  $-2^7i$

104. Equation of the directrix of the parabola whose focus is  $(0, 0)$  ...

Ans :  $x - y + 2 = 0$

105. If  $a$  is real and the 4<sup>th</sup> term in the expansion of

$\left(ax + \frac{1}{x}\right)^n$  is  $\frac{5}{2}$ , then values of  $a$  and  $n$  are ..

Ans :  $6, \frac{1}{2}$

**Note** : Question should be corrected as "the values of  $n$  and  $a$ " are

#### Part 4 – Biology

71. With reference to the skeletal muscle myofilaments

Ans : troponin is a constituent of thin filaments

72. The pituitary gland is

Ans : the anterior lobe receives efferent fibres from the supra-opticohypophyseal tract

73. Urine volume is increased with

Ans : the damage to the posterior pituitary

74. The hypothalamus

Ans : is responsible for temperature regulation

75. Human immunodeficiency virus – 1 (HIV -1)

Ans : contains env gene which encodes the core nucleocapsid polypeptides

76. Staphylococcus aureus :

Ans : phage type I and II are the commonest cause of boils

77. Antibiotic resistance in bacteria occurs by ...

Ans : phagocytosis

78. Following informations are true about ....

Ans : On global basis, it attracted many people as valuable food substance

79. IFN- $\gamma$  is secreted by

Ans : Th 1 cells

80. For antigen presentation to CD4 + T lymphocytes:

Ans : specialized antigen presenting cells are required for the induction of the T cell immune response.

81. Hyperacute rejection is developed

Ans : Pre induction of Anti-HLA antibodies

82. The following are true about mitochondrial DNA

Ans : the sperm does not contain mitochondrial DNA

83. The following informations are true about ...

Ans : 5% of the genome has been conserved by evolution around 200 million years ago

84. The following are the examples of Recombinant DNA product except

Ans : Hemocidin

85. The cell aggregation before it attaches the surface can be reduced ...

Ans : All the above

86. Biological database

Ans : explains the structure of biomolecules and their interactions

87. Which of the following information are true except?

- Ans : Longevity is much lesser than 40 years in under developed countries
88. Major Green house gases include the following
- Ans : Water vapor, Carbon di oxide, Methan, Ozone
89. The following informations are true about the environmental impact on poverty
- Ans : All the above
90. The following informations are true about water stress except
- Ans : Canada and Brazil are facing high water stress
91. The cattle breed which yields around 5000 – 8000 litres of milk
- Ans : Jersey
92. Stethoscope was invented by
- Ans : Rene Theophile
93. Area of the at most least square of the central square ...
- Ans : 0.0025 sqmm
94. The pacemaker used during open heart surgery is
- Ans : Transcutaneous pacing
95. According to the Lamarck theory of evolution,
- Ans : Individuals inheriting the traits of their ancestors
96. Allopatric speciation is one in which
- Ans : Geographically isolated sub-populations diverge
97. Name the Father of Taxonomy
- Ans : Carolus Linnaeus
98. The basic unit of classification is
- Ans : Species
99. Malvacea flower has \_\_\_\_\_ sepals
- Ans : 5
100. Which following plant is involved in starch preparation ?
- Ans : Cassava
101. Xylem conducts
- Ans : Water
102. Palisade parenchyma cells are present in
- Ans : Leaf
103. Plant age is identified by
- Ans : Annual rings
104. Apical meristem is found usually in
- Ans : Shoot tips and root tips
105. The Father of Genetics is
- Ans : Mendel
106. Chiasma formation takes place in
- Ans : Pachytene
107. Which one of the following cannot cause mutation ?
- Ans : Infrared ray
108. DNA is a double helical structure proposed by
- Ans : Watson and Crick
109. The alternative name for genetic engineering is
- Ans : r-DNA technology
110. The enzyme involved in RNA – directed DNA synthesis is
- Ans : Reverse transcriptase
111. Agrobacterium tumifaciens has the \_\_\_ plasmid
- Ans : Ti

112. Protoplasmic fusion is performed by

Ans : PEG

113. An example of C<sub>4</sub> plant is

Ans : Sugarcane

114. The rate of growth of plants can be measured by  
a

Ans : Auxanometer

115. Which one of the following is Phytohormone ?

Ans : Indole acetic acid

116. Hormone promoting maleness in flowering plants is

Ans : Gibberellin

117. Name the micro organisms involved in biofertilizer preparation.

Ans : Cyanobacteria

118. Absence of magnesium causes

Ans : Chlorosis

119. Name the committee approves GM crops

Ans : GEAC

120. Name the botanical name of Groundnut

Ans : Arachis hypogea